

SUPPORT FOR THE AMENDMENT

Support for claims 15, 16, 18 and 19 is found on page 3, lines 4-5 of the specification.

Support for claims 17 and 20 is found on page 7, lines 34-38 of the specification. No new matter would be added to the application by entry of this amendment.

Upon entry of this amendment, claims 1-13 and 15-20 will now be active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to a process for preparing a readily water-redispersable polymer powder and polymer powder prepared by said method.

Aqueous dispersions of polymer particles have many commercial uses. In view of the high water content, transport of such aqueous polymer dispersions can suffer an economic detriment in terms of transportation costs. Efforts to prepare spray dried polymer powders, which can be transported more cost effectively, have experienced some difficulties with redispersion such that process for the preparation of polymer powders which are readily water-dispersible are still sought.

The claimed invention addresses the problem by providing a process for preparing a readily water-dispersible polymer powder by spray drying an aqueous polymer dispersion in the presence of a spray assistant A which is **the reaction product** of a dihydroxydiphenyl sulfone, an aliphatic aldehyde and sodium sulfide. Applicants have discovered that such a reaction product is an effective spray assistant for providing a readily water-redispersible polymer powder. Such a process is nowhere disclosed or suggested in the cited references of record.

The rejection of claims 1-6 under 35 U.S.C. § 103(a) over Weiser et al. (U.S. 5,342,916) in view of Pabst et al. (WO 03/016578) as evidenced by U.S. 6,881,356 as well as the rejection of claims 7-12 under 35 U.S.C. § 103(a) over Weiser et al. in view of Pabst et al. as applied above in further view of Weitzel et al. (U.S. 6,127,483), of claim 14 under 35 U.S.C. § 103 over Pabst et al. in view of Weitzel et al. and of claims 11 and 13 under 35 U.S.C. § 103(b) over Weitzel et al. are respectfully traversed.

None of the cited references disclose or suggest a spray drying process in which the spray assistant is the reaction product of a dihydroxydiphenyl sulfone, an aliphatic aldehyde and sodium sulfide.

Weiser et al. describes a spraying aid using a condensation polymer of sulfonated phenols, urea, other organic nitrogen-bases and formaldehyde (see Abstract). The condensation polymer is identified as also being well-suited for use as a tanning agent (column 4, lines 1-3). There is no disclosure of a spray assistant obtained by reacting a dihydroxydiphenyl sulfone, an aliphatic aldehyde and sodium sulfide.

The basic deficiencies of the primary reference are not cured by the secondary reference of Pabst et al.

Pabst et al. describes a process for preparing a sulfone-containing **tanning material** comprising a component (A) prepared by a) reacting phenol with constituted sulfuric acid, with oleum or a mixture thereof to form a mixture containing phenolsulfonic acid, dihydroxydiphenyl sulfone and sulfuric acid followed by condensation with an aliphatic aldehyde, and a component (B) obtained by reacting a dihydroxydiphenyl sulfone with an aliphatic aldehyde and sodium sulfide. The composition is not described as suitable for a spray drying material but rather only as a tanning material.

Applicants respectfully submit that it would have been obvious to have used the tanning material of Pabst et al. as a spray-drying assistant as the tanning material of Pabst et al. is not sufficiently similar to known spray drying assistants.

Weitzel et al. (U.S. 6,127,483) describes known spray auxiliaries as **naphthalenesulfonic acid-formaldehyde** or **benzenesulfonic acid-formaldehyde** condensation products. Such sulfonated **aromatic acids** are structurally different from the reaction product of a dihydroxydiphenyl sulfone with an aliphatic acid and sodium sulfite. As such, those of ordinary skill in the art would not be motivated to use such a dihydroxydiphenyl sulfone/aliphatic aldehyde reaction product in a spray drying method based on the prior disclosures of naphthalenesulfonic acid-formaldehyde and benzenesulfonic acid-formaldehyde spray auxiliaries.

While the Examiner cites to the condensation polymer of Weiser et al. as both a spray assistant and tanning agent (column 1, lines 9-16) as motivation for using the known tanning material of Pabst et al. in a spray drying method, the unique structures of Weiser et al. which may be used as both a spray drying aid and a tanning agent does not create an expectation that all tanning agents would be expected to behave as spray drying assistants. As previously noted, known spray drying assistants have an aromatic sulfonic acid structure, which is not found in the product of Pabst et al. such that there would be no motivation to use such a reaction product in a spray drying method. For this reason, the claimed invention would not have been obvious and accordingly withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Not only would it not have been obvious to use the tanning agent of Pabst et al. in a polymer powder spray drying method, but there would have been no expectation of improved whiteness for a polymer powder dispersed with a spray drying assistant as claimed. The examiner's attention is directed to table 1 appearing on pages 15-16 of applicants' specification. Powders P1 and P2 were prepared using a spray assistant as claimed and is based on the reaction product of dihydroxydiphenyl sulfone, formaldehyde and sodium sulfite. Powders PV1 and PV2 were prepared using spray assistants based on the reaction product of a sulfonated naphthalene with formaldehyde (SV2) and the reaction product of a sulfonated phenol with formaldehyde (SV3). For the examiner's convenience the data from table 1 is reproduced below.

Powder	Dispersion	Spray assistant	Yield [% by wt. ]	Color	Redispersibility	Yellowing of the film
P1	D1	S1	82	white	good	1-2
P2	D2	S1	83	white	good	1-2
PV1	D1	SV2	84	yellow	good	4
PV2	D1	SV3	83	brown	good	5

Powders PV1 and PV2, prepared using spray assistants based on sulfonated naphthalene (SV2) and sulfonated phenol (SV3) respectively, while exhibiting good redispersibility, also exhibited a **pronounced coloration** as well as a **detectable yellowing** for polymer films formed there from.

In contrast, powders P1 and P2, prepared using a spray assistant as claimed based on dihydroxydiphenyl sulfone, exhibited good redispersibility but exhibited **no pronounced coloration** (white) and significantly **less yellowing** for polymer films formed there from. Thus, even if it were obvious to have used the tanning agent of Pabst et al. as a spray drying aide, there would have been no expectation of improved properties from a polymer powder prepared using such a spray assistant. Thus, applicants have discovered an improved result from the combination as claimed.

Claims 1-12 would not have been obvious under 35 U.S.C. § 103(a) over Weiser et al. in view of Pabst et al. and in further view of Weitzel et al. and accordingly withdrawal of the rejections under 35 U.S.C. § 103(a) is respectfully requested.

The rejection of claim 14 under 35 U.S.C. § 103(a) over Pabst et al. in view of Weitzel et al. is believed to be moot as claim 14 has been canceled without prejudice.

The rejection of claims 11 and 13 under 35 U.S.C. § 102(b) over Weitzel et al. is respectfully traversed.

Weitzel et al. fails to disclose or suggest the claimed spray drying assistant obtained by reacting a dihydroxydiphenyl sulfone with an aliphatic aldehyde and sodium sulfite.

In contrast, the polymer powder of claims 11 and 13 are characterized by having been spray dried in the presence of a **spray assistant A** obtained by reacting a dihydroxydiphenyl sulfone with an aliphatic aldehyde and sodium sulfite. Thus, the presence of spray assistant A is manifest to the polymer powders of claims 10 and 13 as result of the use of the spray

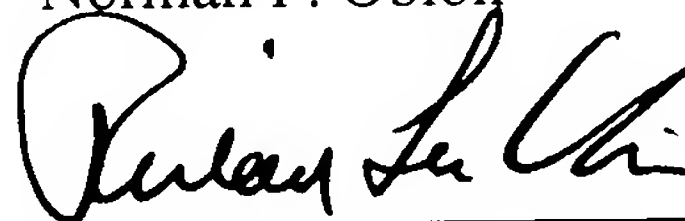
assistant in the spray drying process. As Weitzel et al. fails to disclose or suggest the claimed spray assistant A, the claimed polymer powder of claim 11 as well as the aqueous polymer dispersion of claim 13 are not anticipated as there is no suggestion in the cited references of record of a spray dried polymer having therein spray assistant A. For this reason, withdrawal of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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Norman F. Oblon

A handwritten signature in black ink, appearing to read "Richard L. Chinn", is written over a horizontal line.

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